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Underserved and Overdosed? Muslims and the Pulse Polio Initiative in rural north India

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Abstract:

During the 2000s, confirmed polio cases in India have been increasingly localised in Uttar Pradesh (UP) and Bihar, especially amongst Muslim children. Muslims have also been at the sharp end of the Pulse Polio Initiative (PPI) and the associated 'Underserved Strategy' designed to counter civilian resistance to the programme. Our critique of the PPI draws on long-term research in rural UP and focuses on the programme's socio-political implications. We discuss popular rumours about polio vaccine and official responses to resistance. Taking a longer-term view of top-down single-issue public health programmes, we argue that Muslims in western UP, as a marginalised minority, have good reason to be suspicious of the PPI. Moreover, the PPI arguably reflects the agendas of global funders, not the priorities of local communities. Villagers—Hindu and Muslim alike—have repeatedly criticised government health services for failing to deal with the health issues that worry them most. Their concerns echo other critiques of the PPI, particularly the diversion of resources from other health-related activities that could address the social determinants of health and health inequalities.

Key words: India; Uttar Pradesh; Muslims; Pulse Polio Initiative; Underserved Strategy

Introduction

Patricia: Did your toddler have the polio drops?

Anisa: They [polio teams] come to the houses and give the drops to drink. At first I used to hide my girl and didn't let them give the medicine but now she's having them. She's had them four times.

Shaila (research assistant): Why did you hide your daughter at first?

Anisa: An old woman told me that children become useless after taking the medicine. They won't have any *phal* ['fruits', i.e. children] and that's why I was frightened.

Patricia: Then on whose say-so did you let her take the drops?

Anisa: They [polio teams] force the children to have them. I'm still refusing because I'm frightened about what will happen to my children if they can't have their own children in future. Previously women in this village didn't let their children take the drops because of this fear but now they [polio teams] are forcing the children to take the drops. (Authors' fieldnotes 3 February 2003, Jhakri village, rural Bijnor)

Everyone should have a *penalty*, that if you don't have the injection given to your children or don't let them drink the polio medicine, then you won't get a *ration card*, you won't get any help from the government, your children won't be admitted to school. … I have to tell lies in order to keep my work moving along. And even after doing all that, some child or other will remain [who has

> not had the drops]. (Authors' fieldnotes 5 November 2004: Auxiliary Nurse-Midwife, rural Bijnor)

In 1988, the Global Polio Eradication Initiative (GPEI) was launched in a bid to eradicate paralytic polio worldwide. The Indian government's Pulse Polio Initiative (PPI) is India's contribution to this global effort. Under PPI, oral polio vaccine (OPV) is administered to all young children during recurrent rounds of immunisation (hence the term 'pulse polio'), with health sector employees, teachers and volunteers from organisations such as Rotary Associations and Lions Clubs repeatedly deployed to administer drops at specially created booths and through house-to-house visits; people on the move, including people at fairs and pilgrimage sites, are covered by mobile teams of vaccinators (Aylward et al. 2003; Bhattacharya & Dasgupta 2009; Sathyamala et al. 2005a).[1]

Yet India—along with Afghanistan, Pakistan and Nigeria—remains a polio endemic country. Since 2000, confirmed polio cases—that is, cases attributed to wild poliovirus—have been increasingly clustered in northern India (in western Uttar Pradesh and parts of Bihar). Though poor states with high population densities and poor sanitation, UP and Bihar are not India's most impoverished or insalubrious. Even more puzzlingly, since the early 2000s polio cases in India have become increasingly and disproportionately concentrated amongst Muslim children. In 2006, WHO lamented that 'western UP remains one of the most challenging environments in the world for interrupting WPV [wild poliovirus] transmission' (WHO 2006c: 290).

[1] For a brief discussion of Pulse Polio, see Jeffery & Jeffery (2010b).

During the 2000s, PPI activities have focused intensively on the polio 'hot spots'. The discourses of WHO—the key proponent of the GPEI—contained in the Weekly Epidemiological Records provide insight into how optimism waxed and waned in response to the halting progress and reverses of the PPI. WHO has advocated increasingly frequent immunisation rounds, extensive mapping procedures to monitor coverage and ever more attention to ensuring that all children under five receive the drops every round. Since 2003, these activities have been supplemented by the Underserved Strategy, a high-profile communication strategy deploying celebrities, community leaders and local volunteers. Slogans such as *har bachchā, har bār* (every child, every time) aim to enhance public awareness that all children must receive the *do būnd zindagī kī* (two drops of life) during each immunisation round (Chaturvedi 2008).

Despite this staggering organisational feat, polio cases have continued to be reported throughout the 2000s, with no clear downward trend. Indeed, almost 30 per cent *more* polio cases were confirmed in India in 2009 than in 2008 (see Table 1). There is now a substantial body of scientific but critical work that focuses on the technical limitations of the PPI. Our critique of the PPI, by contrast, approaches the topic from an ethnographic angle and is primarily concerned with the grassroots-level socio-political implications of the intensified Pulse Polio rounds and the Underserved Strategy in the polio hot spots.

< Textbox 1: Research Context and Methods about here>

We draw on our long-term research in rural Bijnor district, western UP, particularly in two adjacent villages, Jhakri and Dharmnagri (see Textbox 1). Whilst polio cases

continue to be reported from the district, it is not a polio hot spot, but it abuts the districts that are. Bijnor was one of nine districts covered by the Underserved Strategy and it has experienced much the same degree of surveillance and number of immunisation rounds as its neighbours (Chaturvedi 2008: 153). The PPI was not central to our work—but it was in full swing during our 2002-5 fieldwork. Staff at the government Additional Primary Health Centre (PHC) on the periphery of Dharmnagri, along with the trained *dāī* (traditional birth attendant) from Jhakri and the *anganwadī* (crèche) worker from Dharmnagri, were making regular rounds in both villages administering polio drops—and Pulse Polio often became a talking point when we updated the maternity histories for all the married women in the two villages, which included detailing children's immunisations.

Our discussion of the PPI and the Underserved Strategy raises several issues. Coercion by the polio teams (highlighted in the quotes that began this paper) indicates that immunisation programmes supposedly intended to enhance collective wellbeing may be confronted by civilian resistance. Muslim parents have often been reported to be more likely than others to refuse permission for their children to be given the polio drops. A widespread public perception reflected in the media is that Muslim recalcitrance is responsible for the continuing polio clusters that endanger everyone. Even though resistance had been overwhelmed by 2005, such a perception continues to echo hoary stereotypes of Muslims as anti-national intransigents who refuse to adopt behaviour beneficial to their own as well as to the national good. As a marginalised religious minority, however, Muslims in western UP have good reason to be suspicious of the PPI.

Moreover, the PPI arguably reflects the agendas of global funders, not the priorities of local communities. Indeed, over the years, Hindu and Muslim villagers alike have repeatedly criticised government health services for failing to deal with the health issues that worry them most. Their concerns echo other critiques of the PPI, particularly the diversion of resources from other health-related activities that could address the social determinants of health and health inequalities.

Pulse Polio Initiative and the Underserved Strategy

Before elaborating on these points, however, we outline the background to the PPI and the Underserved Strategy and the technical criticisms levelled at it (see Textbox 2). In 1978, India's Expanded Programme on Immunisation was established with the aim of providing universal immunisation coverage to tackle several infectious diseases, including polio. The EPI was upgraded in 1985 to the Universal Immunisation Programme, partly because of the impetus provided by Rajiv Gandhi's Immunisation Mission. The programme used trivalent oral polio vaccine (tOPV, to combat P1, P2 and P3). Until the late 1980s, it was largely based on surveillance and the containment of polio outbreaks by immunising those who had been in contact with reported cases.

In 1988, the World Health Assembly proposed a targeted programme whose aim was to eradicate polio globally by 2000 and to certify its eradication by 2005. The approach was to be pro-active, with Routine Immunisation complemented by Supplementary Immunisation Activity (SIA) that entailed coordinated National Immunisation Days (NIDs) and Sub-national Immunisation Days (SNIDs) and 'mop-up' rounds to deal with polio outbreaks. In India, SIAs were termed the Pulse Polio

Initiative. In 1994, there was repeated mass immunisation of children under 5 in Tamilnadu (south India) and Delhi. In 1995, the PPI became a high-profile national mass campaign (Aylward et al. 2003; Bhattacharya & Dasgupta 2009; Sathyamala et al. 2005a).

<Textbox 2: Poliovirus and Immunisation about here>

Internationally, funding levels were increased and more funders contributed to the programme (including WHO, UNICEF, DANIDA, DfID, Rotary International, US-based Centers for Disease Control); the World Bank also provided substantial loans to India ($226 million since 2000) (World Bank 2000, 2003)). Within India, provision was created for maintaining the cold chain that OPV requires. In 1997, a network of laboratories was established under the National Polio Surveillance Project (NPSP) to monitor and report to WHO on the incidence of acute flaccid paralysis (AFP) and paralytic polio. And huge numbers of personnel were mobilised every immunisation round in efforts to ensure complete coverage.

<Table 1 about here>

By 2001, the WHO was optimistic that India would 'interrupt wild poliovirus transmission in the next 6-12 months' (WHO 2001). With the growing geographical concentration of polio cases, the PPI increasingly focused on the hot spots in Bihar and western UP: more immunisation rounds and intensified efforts to ensure complete coverage. Yet there was an 'explosive outbreak' in UP in 2002, 'clustered in a specific community, with more than 60 per cent of cases in the Muslim community of this region' (Sathyamala et al. 2005a: 380; see also WHO 2003). By 2003, this figure was 68 per cent and by 2004 it was 78 per cent (Chaturvedi 2008: 146 & 271).

Sathyamala et al. suggest this was because immunisation teams consistently failed to achieve full coverage of Muslim children during both Routine Immunisation and PPI, partly because the teams had too few Muslims and women (Sathyamala et al. 2005a).

According to the 2001 Census, Muslims comprised about 18 per cent of UP's population (over 30 million). Several districts in western UP contained sizeable minorities of rural Muslims and some Muslim majority towns: in 2001, some 76 per cent of Bijnor district's population was rural, of whom around 34 per cent were Muslims, whilst about two-thirds of Bijnor's urban residents were Muslims (Jeffery & Jeffery 2006). The nearby polio hot spots—JP Nagar, Moradabad, Rampur, Bareilly and Badaun—have similar demographic profiles. In 2001, a communications strategy—Social Mobilisation Network (SMNet)—had been established in these and surrounding districts to provide information about PPI. After the 2002 outbreak, its work intensified. By 2004, it had become the Underserved Strategy, targeted especially at Muslims (and others 'underserved' by the regular health services), reflecting the increasing concentration of polio cases among Muslim children (Chaturvedi 2008: 139).

WHO commented on 'poor participation' and 'inadequate engagement' especially among 'high-risk minority groups', who needed to understand the importance of 'continued, repeated campaigns' (WHO 2002: 323, 2003: 70, 2006b: 290). The Underserved Strategy was now tasked with actively persuading parents to agree to their children receiving the drops (Chaturvedi 2008: 139). Local Muslim leaders were asked to publicise Pulse Polio during Friday sermons and in *madrasas* (Islamic schools). *Madrasas* were also encouraged to host Pulse Polio teams. Prominent educational institutions were asked to provide access to their alumni, including Jamia

Millia University and Jamia Hamdard in Delhi, Aligarh Muslim University, and Daru'l 'Ulūm at Deoband and Mazāhir-i 'Ulūm in Saharanpur (important theological seminaries in western UP whose graduates account for most imams and *madrasa* teachers in the area). Celebrities appeared in public service advertisements and sometimes in person—particularly Amitabh Bachchan, but also Muslim film stars such as Aamir Khan and Shahrukh Khan and the Indian and Pakistani cricket teams. Publicity materials more user-friendly for Muslims began to appear in Urdu, in addition to those in Hindi, and more women were recruited as local coordinators since they could access people's homes better (Chaturvedi 2008).

Declines in the numbers of polio cases in 2003 and 2004 prompted the WHO to predict that India was 'poised to eliminate wild poliovirus' and that imminent interruption of its transmission was 'feasible' (WHO 2004, 2005). In December 2004, with P2 transmission believed to have been interrupted and P3 limited to a small area of western UP, the India Expert Advisory Group for polio eradication recommended the accelerated development and licensing of monovalent OPV1 (mOPV1) to tackle the P1 virus; P1 is more virulent than P3 and mOPV1 was expected to provide a stronger immune response than the trivalent vaccine. Since the immunisation rounds in late spring 2005, mOPV1 and mOPV3 have been used in different immunisation rounds in UP, with tOPV used in non-endemic areas.

Recorded cases in 2005 were fewer and more localised than in 2004 and WHO praised the introduction of 'birth doses' to neonates and the maintenance of high

levels of coverage[2]—whilst also noting that three times as many confirmed cases were reported in the first half of 2006 as in the same period in 2005 (WHO 2006b). Ultimately, more confirmed polio cases were reported in India in 2006 than in any year since 2002. In 2007, immunisation rounds were upped to one per month in UP and Bihar, yet there were more polio cases than in 2006. Notwithstanding, WHO asserted that 'poliomyelitis can be eradicated in India' (WHO 2007). Towards the end of the 2000s, declining numbers of P1 cases reflected the deployment of monovalent OPV1, but numbers of P3 cases began increasing after 2007. In 2009, total numbers of polio cases—mostly P3 cases—exceeded those for every year in the 2000s except 2002 (WHO 2009b). Moreover, by 2007, 94 per cent of P3 cases were among Muslims (Chaturvedi 2008: 146 & 271) (see Map 1).

< Map 1 about here>

Technical Critiques of the Pulse Polio Initiative

> OPV has disappointed everyone—it is both unsafe (everywhere) and inefficient (in developing countries with poor sanitation). … India did not fail for want of effective intervention tools, but because the best of them was wantonly disallowed. The failure was not because of lack of funds, but spending "penny wise, pound foolish." … India's failure was not because of gaps in knowledge, but because of faith in dogma instead of in epidemiology and vaccinology. Polioviruses are fixed in their ways of behaviour; GPEI

[2] Chaturvedi (2008: 14) notes that achieving full coverage of birth doses is difficult because of high birth rates, low birth registration and few institutional deliveries.

> (Global Polio Eradication Initiative) and the GoI (Government of India) must understand the enemy and the weapons, if the war must be won. Underestimating the enemy and overestimating the firepower are sure ways to lose a war. … In India's war on polio there is no general, no war room (John 2006: 5229).

Critics of the Pulse Polio Initiative argue that polio cannot be effectively eradicated using OPV (for more details see Arita et al. 2006; John 2004, 2006; Paul 2006, 2008; Paul & Dawson 2005; Roberts 2006; Sathyamala et al. 2005a, 2005b; Vijayakumar K. & George 2004). Even proponents of PPI acknowledge that children in places like UP may need numerous doses of OPV before attaining immunity, because of poor sanitation, high population densities and the greater proportion of children than elsewhere in India who are immuno-compromised by poor nutrition and intestinal infections (Grassly et al. 2006, 2007; WHO 2006a). The programme's proponents also generally accept that coverage under the PPI (though not under Routine Immunisation) has been very high throughout the 2000s, with perhaps no more than 2-3 per cent of children being missed in UP and less than 1 per cent in Bihar (WHO 2009b; see also Mohamed et al. 2009: 6).

Critics, however, note the ethical and practical issues raised by the risks associated with OPV. Even Mohamed et al. describe the inflation of immunisation rounds as an 'instinctive response … without a critical assessment of their benefit and necessity' (Mohamed et al. 2009: 12). Sathyamala et al. (2005a: 377) are concerned about 'excessive dosing': writing in the mid 2000s, they note that children in the hot spots would have received in excess of 18 doses before the age of 5 (by the late 2000s, the number of doses was significantly higher). Informed consent is generally not obtained

from parents, yet children who receive OPV may succumb to vaccine-associated paralytic polio (VAPP) or paralysis caused by virulent mutations of the live vaccine (circulating vaccine-derived poliovirus, cVDPV) (see Textbox 2). Children who have recently had intramuscular injections—a very common means of treating ailing children in South Asia—are at heightened risk of contracting polio from the live vaccine, yet they are not excluded during the pulse polio rounds. Repeat dosing increases children's exposure to the risk of VAPP and cVDPV. Further, poliovirus from the oral vaccine can circulate 'silently' for years, and infected third parties may develop VAPP or polio caused by cVDPV. Paul, moreover, notes that *unvaccinated* children do not necessarily contribute to virus transmission, whilst children who receive many doses without developing immunity can do so: thus it is inappropriate to blame unvaccinated children for outbreaks (Paul 2006). Indeed, in 2007-2008, 77 per cent of cases of confirmed polio (i.e. attributed to wild poliovirus) had had more than 7 doses of OPV of one kind or another and 18 per cent had had 4-7 doses—which suggests that poor coverage is a rather inadequate explanation for programme failure (despite WHO's repeated emphasis on coverage) (WHO 2009b: 284; see Paul 2008; Paul & Dawson 2005; Sathyamala et al. 2005a).

Proponents of GPEI see the decline in polio cases attributed to wild poliovirus as a sign of the programme's success, but critics question the statistical basis for this optimism (John 2004; Paul 2006; see also Paul & Dawson 2005; Sathyamala et al. 2005a, 2005b). The number of *reported* polio cases worldwide in 1988 was 32,419, but WHO considered this an underestimate and provided an *estimated* figure of 350,000, a figure that is widely quoted without qualification (e.g. Aylward et al. 2003: 35). Polio, however, was not a notifiable disease in India until 1997 and statistics were

not systematically collected. Moreover, there was only *clinical* diagnosis: thus, reported polio cases included cases caused by wild poliovirus as well as of VAPP, cases caused by cVDPV, and acute flaccid paralysis (AFP) with non-polio causes. Since the creation of the National Polio Surveillance Programme in 1997, diagnosis has entailed laboratory-based virological analysis of AFP cases. Only cases of polio cases attributed to wild poliovirus are reported to WHO and many cases of AFP that would previously have been counted as polio are excluded. In 2009, for instance, over 50,000 cases of AFP were recorded in India (18,789 from UP, 13,510 from Bihar). Of these, 742 were attributed to wild poliovirus, whilst 2211 were considered to be VAPP and 21 were due to cVDPV. Thus, the reported declines in polio may appear more striking than they are (and the figures in Table 1 need to be read with some caution).

Satyamala et al. consider that the failure to eradicate polio is not due to 'lack of proper implementation but to a basic flaw in the strategy itself' and the 'single technological solution was unsound, epidemiologically speaking' because the programme was introduced without any sanitary reforms. Thus, they conclude, 'the wild virus continues to lurk in the underground, biding its time, waiting to strike later' (Sathyamala et al. 2005a: 381). Others argue that aiming to control polio—rather than eradicate it—may be a more realistic goal and that inactivated polio vaccine (IPV) needs to be part of that effort (Arita et al. 2006; Paul 2006).

Nevertheless, proponents consider that the interruption of wild poliovirus transmission in India is technically feasible and imminent. Failures of coverage and the 'suboptimal efficacy of OPV' in parts of north India are blamed for polio cases. The way forward is a sustained and robust final push in the hot spots, with

increasingly frequent and targeted immunisation rounds, intensified monitoring and mapping procedures (WHO 2009a) and a targeted communications strategy to ensure that coverage approaches 100 per cent every round. Despite arguments that OPV is both ineffective and potentially dangerous and evidence that the vast majority of new confirmed polio cases are among children who have already received multiple doses of OPV, the PPI continues to use oral vaccines.[3] This has entailed sustaining the pressure on parents to accept the vaccine: some 200,000 vaccinators are mobilised in UP each round (Mohamed et al. 2009) and the hot spots in western UP experienced about 20 rounds of mOPV1, 5 rounds of mOPV3 and one round of tOPV in the 29 months between January 2007 and May 2009 (see WHO 2009b: Fig.1).

Pulse Polio, the Underserved Strategy and Muslims in western UP

Bhattacharya and Dasgupta note that 'all immunisation campaigns are deeply social and political phenomena', not simply medical ones, and the problems associated with the PPI cannot simply be resolved by technical means or the infusion of more cash (Bhattacharya & Dasgupta 2009: 1177 & 1183). They are also *moral* phenomena. During polio immunisation rounds in West Bengal in the 1990s, a 'blame discourse' linked good hygiene and good citizenship: Muslims' health practices and poor

[3] WHO has recently recommended adjustments to the deployment of different combinations of oral vaccines, as well as supplementing oral vaccines with inactivated poliovirus vaccine (IPV), using a new higher vaccine titre mOPV1 and reducing infants' susceptibility to diarrhoea by providing zinc supplements (see WHO 2009c, 2009d, 2010).

sanitation were regarded as a threat not so much to their own bodies but to the body politic—whilst poverty, the OPV and deficiencies in the public health system in general were not implicated (Continho & Banerjea 2000: 665, 713; Das et al. 2000: 630). Similarly, the Underserved Strategy is a tacit acknowledgement that some sectors of the population have fared particularly badly in regard to government public health services. Yet this insight all too readily morphs into a focus on the 'victims' rather than on the institutions and people (politicians, government employees) responsible for serving the civilian population. The polio hot spots—and implicitly Muslims—have been regarded as harbouring a virus that threatens to spread and harm the greater good. For instance, Mohamed et al. generalise from Kosi (Bihar) to suggest that the success of PPI is obstructed partly because populations in north India are 'extremely migratory' (Mohamed et al. 2009: 6) (an implausible characterisation for most small children in western UP) and they emphasise that the

> environmental conditions … where circulation of wild type virus persists optimize polio transmission, with indiscriminate defecation, contaminated water supplies, and extreme crowding of population … Add to this an extremely high prevalence of malnutrition, unclean supplementary food and extremely high birth rate with interbirth intervals as close as one year, and the vulnerability of the very young to polio and other enterovirus infection becomes very apparent' (Mohamed et al. 2009: 7).

During the 2000s, Muslims in western UP have been at the sharp end of the Underserved Strategy and the intensification of the PPI. But this can divert attention not only from the PPI's technical limitations but also from its socio-political characteristics and wider structural issues. Drawing on our own ethnographic data and

linking them to other studies, we now turn to popular rumours about polio vaccine, responses to pockets of resistance, then take a longer-term view of other health-related campaigns, and finally question the prioritisation of the polio programme within health care provision more generally.

The not-so-silent circulation of rumours

The propensity of Muslims to refuse to permit their children to take the polio drops has been widely noted and during our own fieldwork, the lengthiest and most critical (or at least questioning) commentaries came from people in Jhakri, a Muslim village. Some women had heard of children succumbing to what they termed 'polio' after having the drops or some injections (as indicated above, this 'rumour' is not implausible). Women's main fear, however, was that polio drops would stop their *nasl* (family line) because their children would be rendered infertile or impotent. Women in nearby Qaziwala, a predominantly Muslim village where we conducted research in 2000-2002, repeatedly raised the same anxieties.

In 2000, research in Moradabad district (a hot spot near Bijnor) indicated that some people there claimed that polio drops could cause HIV whilst others had heard of polio cases in children who had received the drops. The PPI's increased intensity during 2000 also raised people's suspicions (AIIMS—INCLEN Program Evaluation Network 2000). Similarly, a follow-up study in Moradabad and nearby JP Nagar reports that many Muslims believed the polio drops caused infertility, contained pig fat or had been made by Jews in the US; people said that increasing the frequency of the Pulse Polio rounds would only serve to increase the rumours and resistance and that use of injections—as would be required if IPV were incorporated in the

programme—would frighten children (Chaturvedi et al. 2009; Dasgupta et al. 2008). Rumours about the effects of polio vaccine and why it was being administered free of charge, and suspicions about the frequency of immunisation rounds and the motivations of government staff, were also reported from a study in Moradabad and Ghaziabad (western UP) and Ambedkarnagar/Sultanpur (eastern UP) (EPOS [for WHO] 2002). Continho & Banerjea (2000) reported similar concerns among Muslims in West Bengal in the mid-1990s. Even Chaturvedi, whose account of the PPI is otherwise celebratory, notes that Muslims in western UP were known to be alienated from the central government (which was dominated by the Hindu Nationalist BJP from 1996 till 2004) and that after 9/11 and the invasion of Afghanistan, rumours that the drops caused infertility and suspicions that vaccinated children could succumb to polio 'seemed to fit with notions of a larger global plot against Muslims' (Chaturvedi 2008: 168).

Yet Muslims' views were not monolithic (cf. Continho & Banerjea 2000). During our 2000-2002 research, Farida Khatun, a woman teacher at a local *madrasa* told us:

> The *mahaul* [atmosphere] of the village is completely different from that in the town. They are even afraid of the polio drops. Village women come to ask me if they should give the drops to their children or not. I explain to them and then they give the drops to their children. (Authors' fieldnotes 24 January 2001)

In Jhakri, too, some people accepted the drops. One busy mother told us, laughing as she did so, how her 3-year old daughter would listen for the whistle announcing the start of the day's work and promptly commandeer a neighbour's older child to carry her baby sister to obtain polio drops for them. Along with one of the most educated

men in Jhakri, the village *pradhān* (village council leader) was heavily involved in the Pulse Polio rounds. He commented that many women in Jhakri believed their sons would become *nā-mard* (impotent). When we asked if men also said this, he scoffed that 'men don't have spare time from their own activities—only women say such *ūltī* (upside-down) things.' Several women in Jhakri were also disdainful, commenting that village women generally did not understand the necessity of having the polio drops, that '*chuglī* [rumours] just emerge from women's bellies', that 'women themselves create these things—they have nothing else to do and when several women are sitting together they just make up things' or that 'some women have the habit of telling lies in order to make fun of people.' One commented on the belief that the government was intentionally (*jān būjh-kar*) causing children who took the drops to be sterilised (*nasbandī*): 'women here are very wrong thinking. … I don't know who started this rumour about the drops, but it has spread everywhere' (Authors' fieldnotes 18 February 2003).

Coercion, deception and surveillance

Like other targeted programmes, the PPI has been associated with military metaphors such as 'campaigns', 'weapons', 'enemy' and a premium on meeting 'targets'—which puts pressure on teams at the local level (see, for instance, Hardon & Blume 2005: 347). Chaturvedi's description of the Social Mobilisation Network in UP is a case in point: 'an army faced with a critical war situation where troops are deployed, mobilised and constantly trained to face any eventuality' (Chaturvedi 2008: 139).

Staff may receive incentives for meeting 'targets'—and punishments if they fail. When fears about the effects of the polio drops translate into resistance, the task

becomes even more challenging. Unsurprisingly, some staff employ various tactics to avoid punishment—fudging statistics (e.g. Continho & Banerjea 2000: 664), deceit or coercion. The doctor posted in Dharmnagri commented that many villagers—Hindu and Muslim alike—had initially refused to allow their children to be given polio drops. Some, he said, became violently argumentative, but resistance had declined and the overall response was good. Nevertheless, he and the Auxiliary Nurse-Midwife (ANM) resorted to ruses to increase compliance:

> Now just a few days back, my own ANM began saying, "Dr Saheb, those people are not giving their children the polio medicine." So I told her to say that this was not polio medicine but medicine for *khasrā* [measles]. She should first give the measles injection and then give the drops but tell the people that the drops were not for polio but for *khasrā*, which is spreading a lot these days. … I want polio to be finished off by whatever means. When we do our work, we have to tell lies somewhere or other. (Authors' fieldnotes 20 November 2003)

The ANM still faced problems almost 20 years after she was first posted in Dharmnagri:

> Earlier no one even asked me to sit down—on seeing me, they'd close their doors. One of the people who went with me was beaten with a stick and I myself was sworn at. … Now, after a great deal of explaining, people have begun getting the injections and the polio medicine given to their children. But even now, it's not being done completely. Earlier, I used to frighten people a great deal and tell them lies and then get them to take the polio drops. Sometimes I would take the name of the DM [District Magistrate]. Sometimes

> I'd say that the police would arrest them. … With great difficulty and with telling lies, only after that do I give injections to 1-2 children. (Authors' fieldnotes 5 November 2004)

Sabra (the trained birth attendant in Jhakri) also played her part in ensuring that no children were missed. During the Pulse Polio rounds, she directed the team to households with children, particularly newborns whom she had helped deliver. We asked if people in Jhakri accepted her explanation that the drops were safe: 'No, they don't believe me. They think I'm getting something from the government for stopping children being born, that I'm doing damage to the village people in order to build up my income.' Her daughter commented that many women in Jhakri let their children have the drops only because they fear the 'big people' who come to the village to back up the team, because they do not understand the importance of all children taking the drops (Authors' fieldnotes 20 January 2003). Another young woman—also not opposed to the drops—said the polio teams would catch children and compel them to have the drops. When we asked if the teams did not first explain what the drops were for, she replied:

> The government is doing this for our benefit, but some women don't understand this. … The *doctornī* [female 'doctor' i.e. ANM] does explain the benefits. But even so, the village women don't understand, and *majbūr ho ke, zabardastī dawā pilānī partī hai* [being herself under compulsion, she has to force the children to drink the medicine]. (Authors' fieldnotes 5 February 2003)

As Bhattacharya and Dasgupta note, in western UP more generally, polio programme field workers in the 2000s have been under great pressure and 'outbreaks of wild poliovirus had brought on the threat or imposition of penalties from the top, all of which was leading to demoralization and discontent among personnel of all ranks', whilst hostility and nervousness were generated among civilians when 'polio vaccination was carried out forcibly by health administrators, with the support of the local police' (Bhattacharya & Dasgupta 2009: 1181-1182). From Moradabad district there are reports that 'over zealous methods of enforcement and harassment' were used if parents were reluctant to comply. Community leaders opposed the use of 'unnecessary force' such as deploying police or grabbing children in the street. Some Muslim acceptors had experienced coercion (which they regarded as unnecessary, counterproductive or discriminatory), whilst some people reported leaving their homes temporarily in order to evade the immunisation teams (AIIMS—INCLEN Program Evaluation Network 2000). Coercion, resistance and evasion featured in a study in Moradabad and Ghaziabad (western UP) and Ambedkarnagar/Sultanpur (eastern UP) (EPOS [for WHO] 2002). There is also more recent evidence from Moradabad and JP Nagar of coercion and resistance, with the authors emphasising the continuing need to dispel rumours, restore trust and convince people of the benefits of the polio drops, not just issue warnings and instructions (Arora et al. 2007: 501). Yet, after the intensified immunisation activities in 2007, some resistance remained, especially amongst the most marginalised Muslims and others, who were cynical about the celebrities and local elites involved in the communications strategy (Chaturvedi et al. 2009; Dasgupta et al. 2008).

A longer–term view

India has a long history of top-down single-issue programmes to tackle problems that are perceived as urgent crises. For instance, writing about measures to deal with plague in the period 1896-1914, Chandravarkar comments:

> Many [civilians] responded to the desperation of official measures with an equally desperate resistance to and refusal of official, even medical, intervention. What colonial officers saw as an irrational and obscurantist resistance to the dictates of science and reason only incited them to further, yet more ferocious and despairing executive action. In this way, panic, terror and guilt engorged each other in a seemingly unending spiral. The spiral was broken only when the frenzied temper of the plague measures relaxed (1992: 237-238).

More recently, the smallpox eradication campaign in the mid-1970s included instructing staff to use force if necessary to counter any resistance (which, notably, was most prevalent in UP and Bihar), systems of active surveillance and aggressive searches for defaulters, deployment of police and paramilitary forces, inspection tours including foreign officials, and incentives to locals to report suspected smallpox cases (Bhattacharya 2006: 124, 201, 212-239). Target populations responded in diverse ways: some seemingly willingly accepted what was being pressed upon them but others offered resistance (Bhattacharya 2006: 230ff.). Greenough underlines the compulsions faced by smallpox campaign workers and their tendency to underplay the coercion they themselves then exercised: coercion was normalised and could feed seamlessly into other campaigns (Greenough 1995b). Immunisation programmes, he

comments, are never just about immunisation: a 'logic of resistance' reflects wider issues, including the fears of minorities about the agendas of the majority, and a 'residue of resentment' feeds into people's responses to other government health campaigns (Greenough 1995b: 633 & 643; see also Nichter 1995: 618).

Greenough's reference to minorities is crucial here. Muslims' responses to Pulse Polio have not come out of thin air and their situation in contemporary north India is crucial to understanding their tendency to be suspicious of—if not downright hostile to—Pulse Polio. In north India, Muslims are disproportionately concentrated in the most economically and socially marginal sectors of society (Sachar 2006)—precisely those sectors with the poor housing and sanitation in which infectious diseases flourish. Muslims in rural Bijnor generally own little or no land, and they emphasise labour market discrimination, lack of access to good education and secure employment (see, for example, Jeffery & Jeffery 2006; Jeffery et al. 2007; Jeffrey et al. 2008) as well as their heightened sense of insecurity because of the growth of Hindu nationalism since the mid 1980s (e.g. Jeffery & Jeffery 1994, 1997; cf. EPOS [for WHO] 2002).

The political Emergency (1975-1977) is particularly salient: the government's family planning programme was pursued with particular single-mindedness, with stringent sterilisation targets for family planning and other government staff (including schoolteachers) that resulted in coercive practices, particularly against the poor and religious minorities in northern India (e.g. Connelly 2006; Gwatkin 1979; Vicziany 1983). During our research in Bijnor in 1982, health workers told us how they had persuaded unwilling 'cases' that laparoscopic sterilisation was merely an injection to prevent conception for 5 years. Villagers told us about men being rounded up to be sterilised, and of men hiding in the sugarcane fields to avoid being caught. These

memories still colour how Muslims in particular respond to government initiatives (Jeffery & Jeffery 2010a; Jeffery et al. 2008; cf. AIIMS—INCLEN Program Evaluation Network 2000; EPOS [for WHO] 2002).

Diversion of resources

Clearly, polio has a major impact on the quality of life and prospects of children who suffer from chronic paralysis, whether due to wild poliovirus or oral vaccine. Yet, the PPI is not associated with programmes to rehabilitate children affected by polio, leave aside children paralysed by other causes. Without wanting to underplay this shortcoming, however, we want finally to raise some wider questions that featured in our conversations in rural Bijnor, as well as in the critical literature.

Opposition to Pulse Polio is 'highly complex and cannot be explained by religious affiliation alone' and it has been most conspicuous in areas that have not been well served by government development programmes (Bhattacharya & Dasgupta 2009: 1182). UP is notorious for its poor infrastructure, including health service provision. Indeed, Hindus and Muslims alike have sometimes used their compliance with polio immunisation to bargain for development goods such as clean water provision, drainage and roads (Chaturvedi 2008: 49-53; Chaturvedi et al. 2009). In rural Bijnor, we have had numerous conversations with villagers who consider that the government has not provided the general health care to which they are entitled: that services fail to address villagers' needs, that health staff sell off medicines intended to be freely available to patients. Villagers commented—not always negatively—about the virtual invasion of their villages by the immunisation teams for several days at a time during the frequent polio rounds. Many claimed that this was practically the only time when

health staff came into the villages. If Pulse Polio entails intensive surveillance, persuasion and sometimes coercion, villagers perceive government health services in general as costly absences: the polio rounds compound more routine staff absenteeism and out-of-pocket and often financially-crippling expenditures to private practitioners are often the only available option (Jeffery & Jeffery 2008, 2010a). Complaints about the poor quality of government health services, staff apathy, corruption and caste and religious discrimination are widespread in western UP, as are demands for improvement and the prioritisation of health issues other than polio (e.g. Chaturvedi et al. 2009; Dasgupta et al. 2008; EPOS [for WHO] 2002). Chaturvedi, too, briefly refers to the breakdown of government health services in UP and people's lack of faith in them (e.g. because of the illegal sale of medicines and the high priority of family planning) and she admits that polio is often not a priority for poor people (Chaturvedi 2008: 96-98, 112, 174, 279). Yet she downplays these considerations. As Arora et al. comment, however, a 'reliable and responsive primary health care system will go a long way to dispel cynicism and facilitate effective community dialogue' (Arora et al. 2007: 501).

Villagers are not alone in questioning the wisdom of focusing so much money and staff effort on one health issue, when general health services leave so much to be desired. A public relations officer at the Daru'l 'Ulūm seminary at Deoband told us:

> When the people from UNO [sic] came to discuss the Pulse Polio programme I told them this, that Pulse Polio and the family planning *movements* were less essential than other diseases like AIDS or smallpox or malaria. You could see Muslims queuing in lines for health care because they were poor. It would be better to spend the money on economic development than these health

campaigns (Authors' fieldnotes, 29 March 2004).

Critics of top-down single-issue programmes note that they tend to be more responsive to agendas generated in international arenas than to those originating from the grassroots (e.g. Greenough 1995a: 606; Nichter 1995: 619). Similarly, Sathyamala et al. (2005a: 377) comment that '[p]olio eradication is not a priority for the developing countries. In India, experts admit that poliomyelitis is not a "priority number one in public health," and the reason for selecting the disease for eradication was based on considerations other than its public health importance.' Critics also consider that such programmes tend to compromise Routine Immunisation and primary health care more generally.[4] Indeed, mindful of this, one rationale behind the GPEI was to strengthen health services and Aylward et al. (2003: 45) claim there have been 'irrefutable benefits' with little evidence that broader health concerns have been compromised by GPEI—despite admitting that there is little adequate baseline data on which to make such a judgement.

Data from north India from the first and second rounds of the National Family Health Survey (NHFS-1 1992-3 and NFHS-2 1998-9), however, provided 'little evidence to support synergy between polio campaign and non-polio EPI vaccinations (measles, DPT)' (Bonu et al. 2003: 1807). Another study, using 1997-1998 data, argued that no negative effects of Pulse Polio could be identified, but that the possible positive

[4] These and other related issues continue to be raised about the Global Health Initiatives that have developed during the 2000s. See WHO Maximizing Positive Synergies Collaborative Group (2009) and Editorial (2009).

synergies had not all been realised (Arora et al. 1999). Other commentators, though, claim that Routine Immunisation has been weakened by the focus on polio, that some vaccine-preventable diseases (e.g. diphtheria) have re-emerged and that primary and public health activities have been disrupted (Bhattacharya & Dasgupta 2009: 1181-1182; cf. EPOS [for WHO] 2002; Sathyamala et al. 2005a: 377). In recent budgetary allocations, Duggal notes, 74 per cent of the total immunisation budget has been devoted to Pulse Polio rather than Routine Immunisation. Allocations to disease programmes (TB, malaria, diarrhoeal diseases) have been lower than allocations to Pulse Polio and have not grown in line with other aspects of the National Rural Health Mission of which they are part. Moreover, when central government provides funds for health services, states tend to use them to *replace* rather than *supplement* their own health budgets (Duggal 2009). Data from NFHS-3 (2005-6) indicated that UP had the lowest coverage with 'full immunisation' (complete courses for TB, DPT, measles and polio) in India (barring only Nagaland): fewer than 23 per cent of children were fully covered (though, significantly, coverage for polio was around 88 per cent) (IIPS and Macro International 2008: 15). This study also found that 58 per cent of five year olds in UP were stunted, 15 per cent were wasted (p.18) and 74 per cent of children aged 6-59 months were anaemic, 4 per cent of them seriously (and levels of anaemia among children aged 6-35 months had worsened since NFHS-2) (p.20). Parents reported ailments such as acute respiratory infections, fevers and diarrhoea among their young children (p.16) (a profile that closely parallels the reasons parents in rural Bijnor gave for child deaths; see also EPOS [for WHO] 2002). UP has the highest infant and under-5 mortality rates in India (at 73 and 96 per 1000 live births respectively) (IIPS and Macro International 2008: 10). With about 5 million births

annually in UP, around 360,000 infants each year die before their first birthdays (and many more suffer ailments that compromise healthy growth). But polio and AFP in general make relatively small contributions to UP's profile of child mortality and morbidity.

In sum, the Pulse Polio Initiative has been a coercive programme. Rather than re-examining its widely-criticised systemic limitations, the official response has been to redouble efforts to persuade doubting and resisting civilians (especially Muslims) to comply during the ever more frequent and intensively-monitored immunisation rounds. Ironically, despite the insight that Muslims are 'underserved', Muslim children in the polio hot spots have received numerous doses (perhaps overdoses?) of oral polio vaccine. But little has been achieved to remedy the appalling state of government health services in western UP or to invest in sanitation that would reduce many sources of childhood morbidity and mortality (including those that sustain the transmission of poliovirus). Whilst most Muslim parents in rural Bijnor and north India more generally accept polio drops (if only reluctantly and after robust persuasion), unsurprisingly many others have been hesitant or suspicious. Sustaining intensive immunisation activities over several years with repeated near 100 per cent coverage has been costly, financially and in terms of staff 'fatique'. But these exertions have not addressed Muslims' social and economic marginalisation—whilst the disaffection which that generates has, we suggest been further solidified by the polio rounds.

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Table 1: Polio Cases attributed to wild poliovirus in India (2000-2010)

Year	All-India	Uttar Pradesh	Bihar
2000	265		
2001	268	216	27
2002	1600	1242	121
2003	225	88	18
2004	134	82	39
2005	66	29	30
2006	676	548	61
2007	874	341	503
2008	559	305	233
2009*	741	602	117
2010*	(22)	(10)	(6)

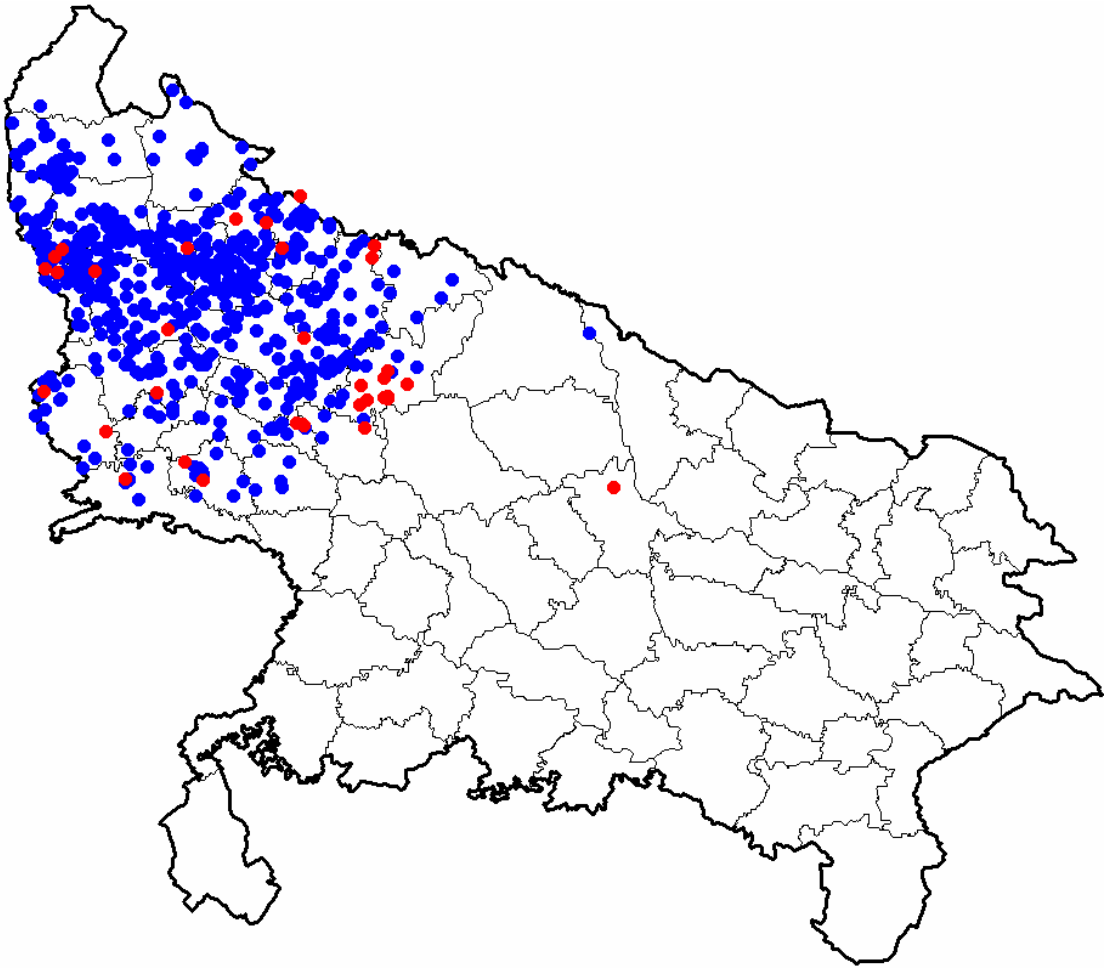
Sources:

For 2000-2008: WHO Weekly Epidemiological record www.who.int/wer (see bibliography for relevant numbers assessing the situation in India).

* For 2009 and 2010: AFP Surveillance Bulletin–India (GOI/NPSP) http://www.npspindia.org/bulletin.pdf provides weekly updates (the figures in the table are for week ending 26 June 2010)

Note: Figures in the table include only polio caused by 'wild' poliovirus i.e. virus contracted in the community. These are the figures reported to WHO. Polio cases attributed to the oral vaccine are not included.

Map 1: Polio cases attributed to wild poliovirus in Uttar Pradesh in 2009



Source: http://www.npspindia.org/bulletin.pdf for week ending 26 June 2010

Red dots indicate P1 cases (34 cases in 17 districts)

Blue dots indicate P3 cases (569 cases in 25 districts)

Total of 602 cases (including one case of P1+P3)

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Textbox 1: Research Context and Methods

We have conducted several ethnographic studies in rural Bijnor since 1982, particularly in two villages some 5 kilometres from Bijnor town: Jhakri (Muslim population of 665 in 2002) and Dharmnagri (Hindu and Dalit population of 1125 in 2002). Bijnor district shares unfavourable social and demographic indicators with the rest of UP, but fares relatively well on indicators of economic development because Green Revolution packages introduced in the mid-1960s transformed agriculture. Landholdings, however, are rarely more than 0.8 hectares and few villagers can rely wholly on agriculture. Those with little or no land seek other employment (e.g. as motor mechanics in Bijnor town, or agricultural labour).

We have collected qualitative and quantitative data about both villages in 1982-3, 1985, 1990-1 and 2002-5, interviewing villagers as well as local health care providers (including traditional birth attendants and *anganwadī* [crèche, literally 'courtyard'] workers, and trained and untrained practitioners in private practice and government service). The research received ethical approval from the research ethics committee of the School of Social and Political Science (University of Edinburgh) and we have followed the ethical guidelines of the British Sociological Association throughout our research (http://www.britsoc.co.uk/equality/Statement+Ethical+Practice.htm). Our guarantees of confidentiality and anonymity and our frequent visits since 1982 have been vital in facilitating an in-depth understanding and in building the trust that is reflected in numerous conversations when villagers have (for example) criticised government health staff without fear of recriminations. The quotations in this paper are from our translations of the detailed reports written up in Hindi by our research assistants. All personal names used in this paper are pseudonyms. For more information on Bijnor district and on our research methods, see our publications listed in the bibliography.

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Textbox 2: Poliovirus and Immunisation

In tropical areas, wild poliovirus is mainly spread through contaminated faeces, especially in places with high population densities and poor sanitation. Wild poliovirus has 3 strains, P1, P2 and P3. (P2 transmission was thought to have been successfully interrupted in 1999 but a case of P2 was reported in India in 2009). Many more people are infected with wild poliovirus than develop symptoms: around 200:1 for P1 and 1000:1 for P3. Carriers of wild poliovirus may continue to excrete it without developing paralysis, but infecting others, only some of whom will develop polio. This 'silent circulation' of wild poliovirus can continue for years without cases of polio occurring, so it is difficult to ascertain that wild poliovirus transmission has been completely interrupted. There are currently two methods of immunisation: inactivated poliovirus vaccine and live attenuated oral poliovirus vaccine; this tabulation outlines the differences between them (see WHO (2010) for more details):

Inactivated poliovirus vaccine (IPV)	**Live attenuated oral poliovirus vaccine (OPV)**
Heat stable at ambient temperatures	Requires cold chain
Administered by injection, requires sterilisation equipment and trained staff	Oral administration, does not require special equipment or trained staff
10 times more expensive than OPV	Relatively cheap
Immunity usually attained after 2-3 doses	'Immuno-compromised' children may not become immune even after numerous doses
Protects only immunised individuals	May result in 'herd immunity' when live virus from the OPV excreted by immunised children is ingested

	by third parties who attain immunity; for India, this was considered particularly likely where sanitation is poor and population densities high (critics consider 'herd immunity' has not occurred)
No proven serious adverse effects	Recipients of OPV and third parties may suffer vaccine-associated paralytic polio (VAPP) or paralysis caused by virulent mutations (circulating vaccine-derived poliovirus or cVDPV); symptoms are clinically identical to polio caused by wild poliovirus.